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AND A

NEW METHOD

OF

ADMINISTERING IT.

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Read before the Medical Section of the Canadian Institute, Toronto, November 28th, 1868, and published by request.

NEW YORK:

WILLIAM WOOD & COMPANY, 61 WALKER STREET.

1869.

CHLOROFORM.

Impurities of Chloroform*.—Pure chloroform is neutral to test-paper; its specific gravity is 1.49 to 1.5, and it boils at 1.40 F. If dropped into distilled water it collects at the bottom in transparent globules. When it is mixed with an equal volume of officinal sulphuric acid in a glass-stoppered bottle, no heat is evolved; and after standing for twenty-four hours, only a faint yellow colour is imparted to the acid. On evaporating three or four drachms of pure chloroform from a porcelain plate, no pungency or empyreuma is observed, but a slightly aromatic odour; and the plate is covered with a film of moisture without odour or taste.

The most common impurities and adulterations of chloroform are: alcohol; ether; chlorinated pyrogenous oils; hydrochloric and hypochlorous acids; chlorine, and Dutch liquid.

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*I am indebted for the chemical tests in this section, to my associate Dr. R. A. Reeve, late Professor of Chemistry, Kingston.

Alcohol and ether reduce the specific gravity of chloroform below the normal standard; and the impure liquid when dropped into distilled water, falls to the bottom in milky globules. (Mialhe). A solution of bichromate of potassa in sulphuric acid becomes green, on the addition of chloroform containing alcohol (Procter); and almond oil is rendered milky by the admixture of chloroform having 5 or 6 per cent of this impurity. (Soubeiran). Albumen (white of egg) is coagulated by chloroform, if alcohol is present. Chloroform that contains alcohol or ether is diminished in volume by agitation with water; and when potassium or sodium is thrown into the adulterated article, sharp, acrid fumes are evolved. Ether may also be recognized by its smell; and by tinging drops of chloroform dull-red, which have been added to an aqueous solution of iodine. (Berchon).

Chlorinated pyrogenous oils are detected by shaking together equal volumes of the impure article and pure, strong sulphuric acid; a brown colouration is produced. These impurities result, most frequently, from the use of methylated, instead of rectified spirits, in the preparation of chloroform.

Hypochlorus acid and chlorine are recognized by their odour and bleaching power.

Hydrochloric acid is detected by its acid reaction, and, after its extraction with water, by the ordinary tests.

The presence of Dutch liquid is revealed by the addition of an alcoholic solution of potassa; volatile chloride of acetyl is evolved, of a disagreeable odour.

Action of Chloroform.—Various theories have been advanced to explain the physiological action of chloroform. According to the theory that was first advanced on this subject, chloroform exerted a primary action upon the brain and central nervous system. It was believed that the chloroform was absorbed into the blood unchanged, and that the general insensibility was the result of its contact with the nervous system for which it seemed to have an affinity of election. In support of this theory, it was shown that after death, from ether or chloroform, a superabundant portion of the anæsthetic is found in the brain and spinal cord. (Lallemand, Perrin, Duroy, Dr. Austie.)

The following results of experiments on animals are opposed to this theory:

1. The brain may be exposed and chloroform applied either to its external surface or to its substance when divided, without producing symptoms of narcotism.
2. Chloroform may be injected into the carotid arteries without bringing the animal under its influence.
3. An animal may be placed under the influence of chloroform, in the ordinary way, and portions of the brain removed, and the animal will awaken in due time as if nothing unusual had occurred.

It was also objected that although after death from chloroform, a large quantity of the anæsthetic is found in the brain, this arises simply from the fact that it's soft substance is favorable to exosmose, and the storing up of the fluid, and not from any special affinity that the brain has for anæsthetics.

It was also pointed out that after death from chloroform or ether, the anæsthetic is found in large quantities in the liver, although we do not attribute the symptoms of anæsthesia to its presence in that organ.

Another objection to this theory was that the effects of anæsthetics passed off too rapidly to

admit of any elective affinity on the part of the brain.

This theory of cerebral affinity was held by M. M. Lallemand, Perrin, Duroy, Flourens and Dr. Anstie.

The more recent experiments of Snow, Richardson, Sansom, Nunneley and the Chloroform Committee of the Medico-Chirurgical Society of England, lead to the belief that the *blood* is the element of the organism that is first acted upon by anæsthetics.

Dr. Sansom pointed out that when the vapor of chloroform is breathed for the purpose of producing narcotism, it may obviously do one of two things; it may be absorbed into the fluid part of the blood, and manifests its effects by its direct action on the brain and nervous system; or, it may act on the blood "modifying its vitalization—modifying that interchange of elements necessary to perfect health."*

It has been proven that when carbonic acid gas has been inhaled, it produces anæsthesia by arresting the aëration of the blood; the carbonic acid which it is the function of the lungs to eliminate, remain in the blood, and an additional

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* "Chloroform; its Action and Administration." By A. E. Sansom, M.B. London.

quantity is absorbed. According to M. Claudo Bernard, when carbonic oxide is inhaled, it poisons by preventing arterial blood in the capillaries of the peripheral portions of the body from becoming venous ; it acts directly upon the blood globules by arresting the process of endosmose and exosmose of their cell-walls—thus preventing the absorption of the gas in the midst of which they lie, and preventing the yielding up of the gas which they inclose.

Dr. Sansom and others believe that carbonic acid gas and carbonic oxide are true anæsthetics, and that chloroform, ether, and even nitrous oxide gas, produce a primary effect upon the blood in a similar manner,—that they all act by suspending the due oxygenation of the blood, and that when death takes place from the inhalation of an anæsthetic, the person dies for the want of atmospheric air ; in other words—*from suffocation.*

Statistics, &c.—Within the last few years the subject of chloroform has been thoroughly investigated by a committee appointed for that purpose by the Medical and Surgical Society of England. During their investigations, the committee were enabled to collect the records of 109

cases of death from chloroform. Drs. Sansom, Snow, Kidd, and others have also placed on record a large number, making a total of nearly 250 fatal cases. From an examination of these cases of death from chloroform, we may learn some "valuable facts regarding the danger of chloroform, and the circumstances which modify it." These may be summed up as follows :

1. A large number of the deaths occurred at an early stage of the administration—before the commencement of the operation.
2. The deaths have occurred chiefly among males.
3. The average age at which these deaths have taken place is about 30 ; no death is recorded under 5 years of age ; one death took place at 60, and one at 65.
4. The more healthy and vigorous the patient the greater is the danger from chloroform.
5. The largest proportion of deaths has occurred in cases of the most trivial operations.
6. The great proportion of deaths has been in cases wherein but little chloroform has been inspired (Sansom) ; in 5 cases collected by Dr. Sansom the amount used was only half a drachm or less*.

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*It is to be regretted that, from the records of fatal cases, and of those in which signs of danger occurred, we are

The "diseased conditions" which are found to increase the danger from chloroform are: intemperance, fatty degeneration of the heart, a poisoned condition of the blood, as uræmia, pyæmia, and delirium—shocks, hysteria, and nervousness. A large number of deaths have taken place in patients with fatty degeneration of the heart, and in cases of habitual intemperance or chronic alcoholism.

Signs of Danger.—In examining the records of cases in which signs of danger occurred under the influence of chloroform, we find that out of 64 such cases, there was, cessation of the pulse in 19; muscular excitement in 15; embarrassed respiration in 13; pallor of face and lips in 11; cessation of hæmorrhage from wound in 2; and vomiting, followed by immediate death, in 2 cases. The signs of embarrassed respiration, it is found, seldom or never occur except in cases of chronic alcoholism and in the later stages of the administration, where the profound influence

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unable to form an idea of the strength of the vapour that was inhaled. The records of these cases should state not only the amount of chloroform administered, but also, the *length of time* during which a given amount was being inspired. With these two facts, and a description of the method of administering the anæsthetic, we may learn something of the percentage of the vapour that was administered.

of the chloroform is indicated by irregular breathing and stertor. According to Dr. Sansom "the history of all (fatal cases) is, that the heart's action ceased before the breathing; that in fact, death was due to syncope, *i. e.*, paralysis of the heart." Out of a total of 3058 cases in which chloroform was administered, alarming symptoms occurred in 21 cases; of these, 5 occurred within half a minute of the commencement of the inhalation.

Post Mortem Appearances.—From 51 post mortem examinations in cases of death from chloroform, it was found that an "almost constant sign was darkness and fluidity of the blood," and that a "frequent sign was accumulation of blood in the right chambers of the heart."

Modes of Death.—In animals, death from chloroform, according to Dr. Sansom, "occurs in a definite manner—by that form of asphyxia which is due to the suspension of the motor power supplied to the muscles of respiration; death may be said to commence in the brain. In man, death occurs by a more complex mode, modified by general conditions of the system; by emotional influences, and by the method's by

which chloroform is administered. Death in the human subject may take place (from chloroform) by syncope, by asphyxia and by necræmia."

Resuscitation.—The treatment of cases of apparent death from chloroform has also occupied the attention of the Medical and Surgical Society of England, as well as the Medical Society of Emulation of Paris. From their experiments and investigations we learn that the only perfect stimulus to the "failing heart" is "sufficiently aerated blood" and that "the only modo of producing it is the excitation of respiration." (Sansom.)

The Committee of the Medical and Surgical Society report on this subject as follows:

"From experiments on animals, and also from a consideration of cases of accidents with chloroform in the human subject, the Committee is strongly of the opinion that the first and most important means of resuscitation is artificial respiration." * * * *

"It is of the most pressing importance that artificial respiration should be commenced the moment the alarming symptoms exhibit themselves. The delay, even of a few seconds, will

doubtless, in some cases, destroy the only chance of life. Artificial respiration should be practised in the manner known as Dr. Sylvester's method, and as recommended by the Committee on Suspended Animation." * * * * *

"Mouth-to-mouth insufflation is a most valuable method of resusitation. By it several good recoveries have been effected, a large quantity of nearly pure air being blown into the chest at each insufflation. In all cases in which it is employed the nostrels should be closed, and the larynx should be pressed against the spine, to prevent the escape of air down the œsophagus."

Dr. Sylvester's method of producing artificial respiration, recommended by this Committee for cases of apparent death from chloroform, is also recommended by the Royal Humane Society as the best method of inducing respiration in cases of apparent death from drowning, still-birth, noxious gases, &c. This method may be briefly described as follows: The patient is placed without delay, on his back, on the floor, couch, or table, with an impromptu cushion under the shoulders, and the body "slightly inclined from the feet upwards." The tongue should be drawn forward and kept in position by an assistan

or by an elastic band. The forearm is flexed on the arm, and the surgeon, grasping each near the elbow, presses them firmly against the sides of the chest. The arms are then immediately raised by the sides of the head and kept "stretched steadily upwards and forwards for two seconds."

Dr. Sansom recommends that before commencing the respiration, pressure be made with both hands on the lower third of the sternum, and also on each side of the thorax; by which means he believes that from 15 to 20 cubic inches of the residual air of the lungs may be expelled. According to Herbst, after respiration, there will still be about 170 cubic inches of residual air in the lungs. When this air is surcharged with chloroform, "it is obvious that the first efforts should be directed to the getting rid of it."

The following directions by Dr. Sansom for resuscitating cases of apparent death from chloroform are so judicious and complete that I cannot do better than give them nearly entire. He says—"If in the course of the inhalation you notice a sign of danger; if sudden pallor occurs; if the pulse fails; if after severe muscular ex-

citement there is sudden collapse; or if there is an evident embarrassment of respiration, at once remove the chloroform, and

1. Bring the patient to the recumbent position. The blood regurgitating from the system to the heart may induce in the latter renewed contractions.
2. With the finger or with a pair of forceps, draw forward the tongue.
3. Make a few alternate pressures by both hands upon the lower part of the sternum.
4. Commence artificial respiration. Having first brought the patient's arms to the sides, and exerted pressure against the walls of the chest to expel some of the air, lift the arms straight above the head, then bring them again to the sides and compress. Repeat this frequently, but be sure that it is done thoroughly, the arms well extended and the chest firmly pressed. It may be well to let another press the lower part of the sternum so as to favor respiration.
5. At the same time let *warmth* be applied to the body; let no time be lost; let no cold air circulate near; do not dash cold water upon the chest. Let friction be employed, the di-

rection being from the toes upwards. If there be a possibility, let the galvanic apparatus be sent for.

6. If the apparatus is at hand, place the conductor (covered with a wet cloth), which is in contact with the negative pole of the primary wire of the battery, over the phrenic nerve on the right side of the neck, pressing it well in; the other conductor also wetted should be pressed into the epigastrium; now set the battery in action for one or two seconds; this will cause instantaneous contraction of the diaphragm; remove either of the conductors for ten or fifteen seconds and repeat.

7. If, after five or ten minutes, there is no recovery, or if the symptoms indicating danger have been characterized by difficult respiration, or coma, perform tracheotomy; but continue your efforts at mechanical resuscitation. Do not relax the efforts, even if no sign of life return for at least half an hour.

8. Enemata of brandy and water may be administered during the process, and if the patient recover sufficiently to swallow, a little stimulant may be at once given."

I would simply add to the above that I consider the use of the galvanic battery superfluous. The different means of producing mechanical respiration seems quite sufficient. The mouth-to-mouth insufflation answers best in children, and in cases where the signs of danger are sudden and early. In other cases, particularly where it is necessary to continue the respiration for a length of time, Dr. Sylvester's method is the best.

ADMINISTRATION.—We now come to that part of the subject to which I wish more particularly to direct your attention; namely, to the method of administering chloroform. The usual method is to pour one, two, or three drachms of chloroform, upon a handkerchief or towel, and hold it near the mouth; sometimes a towel is folded in the form of a cone; an uncertain amount of chloroform is poured into it; and the cone is placed over the nose and mouth, without any knowledge of, or regard to, the strength of the vapour that is being administered. When we consider how common it is to administer chloroform in this careless manner we can only wonder that fatal cases are not more numerous. Out of 858 cases collected by Dr. Anstie in which chloroform was given in the ordinary way, 16 present-

ed signs of danger; or one in every 53; while in 2200 cases in which means were taken to secure proper dilution of the chloroform vapour, there were dangerous symptoms in only 5 ; or only 1 in every 440.

The objection to the ordinary method of administering chloroform is its great irregularity and uncertainty; at one moment the patient may inspire a saturated atmosphere of chloroform, at another "a breath may be taken of almost pure atmospheric air."

In the administration of chloroform two principles must be kept in view, namely, the principle of "tolerance" and that of "definite dilution." When the administration is commenced with a very dilute atmosphere of chloroform, and the strength very gradually increased, it is found that the system will, in a few minutes, bear with safety the anæsthetic of a strength that would be dangerous to administer at the outset. This is called by Dr. Sansom the "principle of tolerance."

Again, it is considered imperative to use due means to secure proper dilution of chloroform vapour. The committee of the Royal Medical and Chirurgical society report on this subject as follows :—

"The several effects produced by the administration of chloroform, as well as other anæsthetics, are tolerably uniform if the same strength of vapour be employed; and there is much reason to suppose that the irregularities attributed to it have been in a great measure due to the uncertain degree of its concentration. Experiments upon the lower animals, however, equally with observations on man, prove that there is but a narrow limit between that strength in which the vapour may be safely inhaled, and that which is likely to produce alarming symptoms if not death."

"But whether the hazard originated in natural or accidental causes, the conclusion must be the same, that it is extremely desirable to adopt a method of administration by which the quantity of the vapour actually being inhaled may be graduated.

"The results of the experiments which have been detailed show that it is as desirable to measure accurately the strength of the vapour as to weigh the dose of a medicinal agent administered by the mouth."

Dr. Snow considered it dangerous for the human subject to breathe more than five per cent. of the vapour of chloroform. Mammifers

can remain in an atmosphere containing four per cent. of chloroform vapour, but will die speedily in an atmosphere of eight per cent. The chloroform committee recommend that "in order that it may be administered (continuously) with comparative safety it is necessary that the proportion of vapour should not exceed three and a half per cent."

The administration of a definite dilution of chloroform vapour can be attained with exactness only by means of mechanical apparatus specially adapted to the purpose. Of such the inhaler of Clover is the most perfect. This apparatus consists of a large bag or reservoir which is filled or partly filled, with a mixture of atmospheric air, and 4 per cent of chloroform vapour. To this bag is attached a flexible tube and Dr. Sibson's mouth-piece. The mouth-piece is so arranged with valves that at the commencement of the inhalation the patient inspires nearly pure atmospheric air; by degrees, a valve is closed, so that two or three minutes from the commencement of the inhalation the patient inspires the mixture from the bag only. By means of this apparatus we are enabled so to administer the chloroform as to secure *tolerance* and *definite dilution*. The patient can be brought very gradually under

the influence of the anæsthetic and we can administer the vapour of known and definite strength. Mr. Clover says of this apparatus,—"I have found my inhaler produce the anæsthesia more uniformly than I have been able to effect by any other means. Patients very rarely cough or make any manifestation of the vapour being too pungent. A large majority of the patients are prepared for the commencement of the operation in less than six minutes, and they certainly recover from the effects of chloroform more readily, and with less sickness and prostration than I have observed when I did not make use of the inhaler." Mr. Sansom says,—"I consider this to be the safest method of all for the administration of chloroform. * * For myself, speaking theoretically, I believe that this means obviates the most urgent objection to chloroform administration, and is especially useful where patients are assembled together ready to be operated on one after the other."

Unfortunately Mr. Clover's apparatus is too cumbrous and expensive to be generally used by the profession. I submit, however, that it would be well if it were used in all public institutions where chloroform is frequently administered. Other inhalers are in use, such as

that invented by Dr. Snow, and more recently that invented by Dr. Sansom ; they are more portable, but it is not claimed for them that they attain to anything of the perfection of the apparatus of Mr. Clover.

Notwithstanding the very great advantages of mechanical means for the definite dilution of chloroform-vapour, and the number of fatal cases that are constantly occurring from the administration of chloroform by the "ready method," it is probable that the great majority of practitioners will still use the towel or the handkerchief. The next question that arises is this ; admitting that the great objection to the "ready method" is its irregularity and uncertainty, is it not possible so to conduct the administration with a towel or handkerchief that we may form at least an approximate idea of the strength of the vapour that is being inhaled at a given time? I believe that this question can be answered in the affirmative. And, in proposing a new method of administering chloroform-vapour I trust that it will be the means of still further extending the great boon of Professor Simpson's invaluable discovery, inasmuch as, the adminis-

tration of chloroform for the relief of human suffering "by the immense preponderance of its influence for good, has been a direct conservator of human life."

For the last seven years I have been in the habit of administering chloroform *guttatim*, in a manner similar to that known as "Professor Simpson's method;" and, during the last six or eight months, I have been endeavoring to reduce this seemingly inexact method to a system approaching very nearly the exactness that is attained by the most admirable, though complicated and cumbrous, apparatus of Mr. Glover;—I have been conducting a series of experiments with the object of determining the minimum quantity of chloroform necessary for inducing narcotism at different ages, and for different purposes; and to administer the chloroform in such a manner as to enable me to form a pretty correct estimate of the degree of dilution of the vapour that is being administered at a given time. In this I believe I have not been unsuccessful.

My method of administering chloroform is as follows:—The patient is placed on his back

either on a couch or table; and a linen napkin is placed over the face, so that one thickness only covers it. A two-drachm vial is filled with chloroform; an assistant observes the pulse, and holds the watch in such a position that the administrator may see the second hand. The administrator assumes a convenient position at the head of the patient, and, everything being ready, with the left hand he raises the napkin so that it does not touch the nose, about one-and-a-half inches from the mouth. The chloroform is now carefully dropped upon the napkin, over the mouth, a definite number of drops being allowed to fall per minute, commencing with a minimum quantity and gradually increasing until, in the third minute, the maximum quantity is reached. One-third the maximum dose is given during the first minute, and two-thirds during the second. The maximum dose should be continued from two to six minutes, according to the effect of the anæsthetic upon the patient, and the degree of narcotism desired. Where it is necessary to keep up the narcotism for a length of time, the maximum quantity of chloroform may be repeated occasionally (as often as the condition of the patient may seem to require) or about one-

half the maximum quantity may be administered continuously.*

To adults, I have never given more than 35 drops per minute, as a maximum dose ; 30 drops per minute, I have found in most cases to be sufficient. For children 11 or 12 years of age, I have found that a maximum quantity of 18 drops per minute is sufficient. For children from 7 to 9 years of age, about 15 drops a minute is sufficient. Children about 5 years of age require from 8 to 10 drops a minute. In all cases about one-third the maximum dose is given the first minute ; and two-thirds the second

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* In the *Edinburgh Medical Journal*, for December, 1861, a short paragraph appears, in which Prof. Simpson gives Dr. Moir credit for first administering chloroform *guttatim*. Administering chloroform in this manner is now known as "Professor Simpson's Method." I make this acknowledgment with great pleasure, and wish to disavow any intention of claiming originality in giving chloroform drop-by-drop. So far as I can learn, however, no attempt has heretofore been made to reduce this method of administering chloroform to anything of a system. No attempt has hitherto been made to conduct the *guttatim* method so that—1st. The administration shall commence with an almost imperceptible quantity of chloroform-vapour, and the strength be gradually increased as the system will tolerate it. 2. After tolerance is established, the administration shall continue with a certain definite quantity per minute until narcotism is established. 3. The administrator shall be able to ascertain the per centage of chloroform-vapour that is being administered at a given time. In this I claim originality.

minute; the maximum dose never being reached until the third minute from the commencement of the inhalation.*

When chloroform is administered by this method, I find that in almost every case there is an entire absence of excitement or struggling on the part of the patient. As a rule, the patients pass quietly under its influence as if they were falling asleep naturally. Children pass under its influence usually without objecting to the administration. And, moreover, I have never in any case, observed that peculiar tremor which is said to mark the commencement of complete narcotism. Another feature in this method of administering chloroform is the very small quantity of chloroform required to produce complete narcotism. I seldom require in any case to administer more than one drachm, unless the nature of the operation requires its re-administration.

The next question is this, in administering chloroform by this method, have we any means of ascertaining, even approximately, the strength of vapour that is being inhaled at a given time?

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* I have recently administered the bichloride of methylene *gutlatim* in two cases; and find that the maximum dose is from 35 to 40 drops per minute. In one of the cases (an adult), narcotism was induced in 15 minutes, by administering 30 drops per minute.

I think we have. We make about 17 respirations per minute and inhale about 20 cubic inches of air at each inspiration; this amounts to 340 cubic inches per minute. In three minutes we inhale, in round numbers, about 1000 cubic inches. We will suppose that a patient inhales 33 drops per minute and in three minutes 99 drops, or in round numbers 100 drops. I have ascertained by repeated trials that 100 drops of chloroform dropped from a 2-drachm vial are equal to exactly 40 minims. Chemists state that 40 minims of chloroform will produce 45 cubic inches of chloroform vapour; 100 drops of chloroform will therefore produce 45 cubic inches of chloroform vapour; 45 cubic inches of vapour diffused through 1000 cubic inches is equal to a per centage of $4\frac{1}{2}$. If, therefore, a patient inspires 1000 cubic inches of atmospheric air in 3 minutes and at the same time inspires the whole of the vapour from 100 drops of chloroform, he will be inspiring $4\frac{1}{2}$ per cent of chloroform vapour.

In administering chloroform by this method there seems to be very little of the vapour wasted, probably from 10 to 20 per cent.; if 20 per cent is wasted, that would reduce the $4\frac{1}{2}$ per cent referred to above, to about $3\frac{1}{2}$ per cent, which would be a perfectly safe strength to administer

to an adult in whom there did not exist any contra indication for chloroform inhalation; and when we administer 30 drops or less in a minute, the strength is only 3 per cent or less.

The advantages which I think may be justly claimed for this method of administering chloroform are:

1. The ability to attain with apparatus as simple as that of the "ready method," very nearly if not quite the precision attained by Dr. Clover's inhaler;—to commence the administration with an almost imperceptible quantity of the vapour so as to establish *tolerance* in the system; and subsequently to administer the chloroform vapour of known and definite dilution.

2. Being able, with a very few drops, to bring quietly under the influence of the anæsthetic young children who violently resist the strong atmosphere of chloroform-vapour that characterizes the commencement of the administration when conducted by the "ready method," and who would be frightened at an apparatus so formidable as Dr. Clover's inhaler.

I will conclude this paper by adding a few brief rules that should be observed in the administration of chloroform. Examine the general

condition of the patient, and enquire particularly for symptoms of fatty degeneration of the heart The patient should abstain from food for about four hours before the administration. A little brandy and water should be given to an old or debilitated patient. The dress should be loose about the neck and chest. The apartment should be comfortably warm (about 60 degrees Farenheit). The recumbent position is the best, and should be assumed a few minutes before the administration. The patient should be encouraged as much as possible. The inhalation should be commenced gradually. Where it is necessary to hold a child, he should be retained in position a few minutes before the inhalation commences. The pulse and respiration should be observed, and from time to time the countenance also. The best test of the degree of narcotism is the sensitiveness of the conjunctiva. The patient should retain the recumbent position until recovery from the effects of the anæsthetic. Should vomiting be persistent after the administration of chloroform, it may be controlled by the administration of brandy and soda water.